TEST CERTIFICATE

Date Received	31 January 2024	**Certificate Ref.**	TLM-2410375/2
Date of Issue	02 March 2024	**Clients Ref.**	ISOLCOLL A20 – COL14

Tarmak Client	**Fixline Products Limited LLC, Sultanate of Oman**		
Description	Tiles Adhesive (ISOLCOLL A20 – COL14)		
Tarmak Sample Ref	TLM-1373/2	**Test Location**	Tarmak , Muscat
Source	Jifnain	**Date of Test**	02.02.2024 to 02.03.2024

INTRODUCTION

One sample of Tiles Adhesive (ISOLCOLL A20 – COL14) was submitted to Tarmak Laboratories on 31st January 2024 with a request to carry out the below mentioned test.

1. Open Time
2. Adhesion Test
   2.1. Initial Adhesion after 28 days
   2.2. Tensile Adhesion after water immersion
   2.3. Adhesion after heat action
   2.4. Adhesion strength after freeze – thaw cycle
3. Bulk Density
4. Color/Consistency
5. Solid Content
6. Resistance to Solvents to Alkalis, Oils, Acid
7. Vertical Slip

1. Open Time

Tile adhesive is mixed as per the product specification and procedure mentioned in BS EN 12004-2:2017. A thin layer of tile adhesive is applied on the concrete slab surface. Then a thick layer is applied and comb with a notched trowel.

After 5min, 10min, 20min and 30 mins placed the minimum of 10 tiles 50mm apart on the adhesive within 30 second. Apply a load of 20±0.05N for 30 Seconds. After 27 days of storage under standard condition, bonded the pull head platen to the tiles with a high strength adhesive.

After 24hrs under standard conditions carried out the tensile adhesion strength by using pull out tester. The test result is given as below.

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Test Certificate No. TLM-2410375/2

Test	Test Method	Result
Open Time	BS EN 12004-2:2017	0.5

2. Adhesion Test

Tile adhesive is mixed as per the product specification and procedure mentioned in BS EN 12004-2:2017. A thin layer of tile adhesive is applied on the concrete slab surface. Then a thick layer is applied and comb with a notched trowel. After 5 mins, fixed 10 tiles on the adhesive and gave a load of 20 N for 30 sec., and kept as test specimen for adhesion tests.

2.1. Initial Adhesion after 28 days

The above prepared test specimen kept for 27 days, fixed on 50m metallic plate on the tiles with a high strength bond adhesive after 24 hrs, the plate is pulled out by using pull out tester. The result obtained is given below,

Test	Test Method	Result (N/mm²)
Initial Adhesion after 28 Days	BS EN 12004-2:2017	0.6

2.2. Tensile Adhesion after water immersion

The prepared test specimen kept for 7 days in standard condition and immersed in water. After 20 days removed the test specimen, wiped thoroughly and fixed the metallic plate by using high bond adhesive. After 7 hrs. in standard condition immersed the test unit in the water. The test is carried out on the following day and the test result is tabulated below,

Test	Test Method	Result (N/mm²)
Tensile Adhesion after Water Immersion (28 days)	BS EN 12004-2:2017	0.5

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2.3. Adhesion after heat action

The test specimen was kept in standard condition for 14 days, then place the unit in hot air over at 70±3°C for next 14 days.

Then removed the test specimen and fixed the metallic platen by using high bond adhesive. Kept the test specimen for 24 hrs. and pulled out by pull out tester. The test result is given below,

Test	Test Method	Result (N/mm²)
Adhesion after Heat action	BS EN 12004-2:2017	0.5

2.4. Adhesion strength after freeze – thaw cycle

Conditioned the specimens for 7 days in standard condition and immersed in water for 21 days before carrying out 25 freeze and thaw cycle. The freeze and thaw cycle is given as below

- Removed the test specimen from water and placed in a cold chamber to achieve steady ambient temperature of -15±3°C within 2h±20mins.
- Maintained the test unit at -15±3°C for 2 hrs.
- Immersed the test unit in water at 20±3°C and raised to 15±3°C.
- Maintained the test unit at 15±3°C for minimum 2 hrs.

Repeated the 25 cycle. After the 25 cycle removed the test specimen, wiped out thoroughly and fixed the bond the tiles with a strong adhesive. After 24 hrs. carried out the pull out strength and the test results is tabulated below,

Test	Test Method	Result (N/mm²)
Adhesion after Freeze-Thaw Cycles	BS EN 12004-2:2017	0.5

3. Bulk Density

The bulk density of the tile adhesive is determined by using the test method BS EN 1015-6:1999 clause 7.2.2. The test result is tabulated as below,

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Test	Test Method	Result (Kg/m³)
Bulk Density	BS EN 1015-6:1999 Cl. 7.2.2	1.31

4. Color/Consistency

The color of tile adhesive is identified visually, assured the consistency and reported as below,

Test	Test Method	Result
Color/Consistency	Visual	Grey

5. Solid Content

Test	Test Method	Result (%)
Solid Content	ASTM D 2939	100

6. Resistance to Solvents to Alkalis, Oils, Acid

Test	Test Method	Result
Resistance to Solvents	In House Method	Good
Resistance to Alkalis		Good
Resistance to Oils		Good
Resistance to Acid		Moderately Good

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7. Vertical Slip

Vertical slip test of adhesives according to BSEN 12004 Part 2 2017 typically involves measuring the adhesive's ability to hold tiles in place when subjected to vertical force. In accordance with BSEN 12004 .2.2017 clause 8.2.1.1 prepared the ceramic tiles and carried out the test as per clause 8.2.3. The test result obtained are as given below.

Test	Unit	Result
Vertical Slip	N/mm^2	0.5

For and On Behalf of **Tarmak Laboratories LLC,**

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